

## **ABSTRACT**

A system improves the design of artificial implant components for use in joint replacement surgeries. The system includes an anthropometric static image data analyzer, an implant model data generator, a kinematic model simulator, and a dynamic response data analyzer. The implant model data generator may also use image data of a joint in motion for modification of the implant model data used in the kinematic simulation. Dynamic response data generated by the kinematic model simulation is analyzed by the dynamic response data analyzer to generate differential data that may be used to further refine the implant model data.